Hand-Off Communication among State Tested Nurse Aide Staff in Long-Term Care

DNP Final Project

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Abstract

Communication among caregivers is an essential and critical component to quality patient care and outcomes. Hand-off is a multifaceted, essential communication process that impacts continuity of patient care and needs to be accurate, clear, specific and timely. Development of innovative strategies to promote effective hand-off communication may contribute to safer care environments and improve resident outcomes related to falls.

An information technology-based program for hand-off communication among State Tested Nurse Aides (STNAs), Resident Information Care Essentials (RICE), was assessed to determine its effectiveness in decreasing the rate of falls among the residents in a long-term care facility. Characteristics associated with the residents who fell at the long-term care facility were also assessed.

The investigation utilized a quasi-experimental interrupted time series research design to evaluate the use of RICE on a selected unit within a long-term care facility. Retrospective fall reports for two units within a long-term care facility were analyzed from January 2011 to December 2011, inclusive to determine the unit with the higher rate of falls. The unit with the higher rate of falls was selected as the study unit, and utilization of RICE for hand-off communication was implemented on that unit. After selection of the study unit retrospective fall reports, resident charts, and RICE for all residents of that unit who sustained a fall (as defined by the CMS, 2011) were analyzed on a monthly basis for the 2-months preceding and following implementation of RICE.

Data were analyzed utilizing an independent samples test assuming Poisson distributed data in each time period. The p-value was set at 0.05. Statistical analysis was completed utilizing a generalized linear model routine in SPSS. There was no evidence of a significant

difference in the fall rate. Prior to RICE implementation16 residents fell for a total of 24 falls and after RICE implementation 10 residents for a total of 28 falls. Descriptive statistics were utilized to describe the characteristics associated with the falls and residents who fell after implementation of RICE.

This study represents a beginning in researching the impact of an electronic mode for hand-off communication among STNA staff in a long-term care setting. Due to a national focus on improving the effectiveness of hand-off communication additional research needs to be conducted to focus on strategies to improve hand-off communication in a wide variety of healthcare settings at all levels of patient care.

Chapter One: Nature of the Project

Introduction to the Project

Communication among caregivers is an essential and critical component to quality patient care and outcomes. The Joint Commission Center for Transforming Healthcare (The Center) was established in 2009 to find solutions to healthcare's most critical safety and quality problems. According to The Center (2010b) approximately 80% of serious medical errors involve miscommunication between caregivers when patient care is transferred or handed-off. Sorbello (2008) noted that inadequate communication among caregivers is the most frequent origin of sentinel events which the Joint Commission (2011) defines as an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. The Institute of Medicine (IOM) reported 44,000 to as many as 98,000 individuals die each year due to preventable medical errors (2000).

The IOM (2001) established six aims for health care improvement addressing: safe, effective, patient-centered, timely, efficient, and equitable care. In addition, the IOM noted that improved information infrastructure through the utilization of information technology is needed to establish effective, timely communication among clinicians. One of the IOM's (2001) recommendations included redesigning healthcare processes to promote cooperation among clinicians through collaboration and communication to ensure an appropriate exchange of information and coordination of care. According to the IOM (2001) safer, high-quality care will need to involve redesigning systems of care including the use of information technology to support clinical and administrative processes.

Purpose

The Joint Commission established National Patient Safety Goals (NPSGs) in 2002 to address areas of concern related to patient safety. Improving effectiveness of communication among caregivers was established as a NPSG in 2006 and it remains a goal for the 2013 year (The Joint Commission, 2012). The Center has focused on four project areas: (a) hand hygiene, (b) hand-off communications, (c) surgical site infections, and (d) wrong site surgeries (The Center, 2010a). Hand-off communication is the transfer of patient information from one caregiver to another caregiver or from one team of caregivers to another team of caregivers for the purpose of ensuring the continuity and safety of the patient's care (The Center, n.d.). Redesigning the mode for hand-off communication with the utilization of information technology has the potential to contribute to healthcare improvement by enhancing effective communication among caregivers.

Rubenstein (2006) identified unintentional injuries as the fifth leading cause of death in older adults, and falls account for two-thirds of these deaths. According to Rubenstein approximately three-fourths of deaths in the US due to falls occur in the population age 65 and older. He noted that the lowest rates of falls, between 0.3 to 1.6 falls per person per year, occur among those older adults living in the community. In contrast, older adults of the same age (65 or older) who live in long-term care institutions have much higher fall rates at 0.6 to 3.6 per bed annually. In addition, falls among individuals in institutions tend to result in serious complications, with 10% to 25% of such falls resulting in fracture or laceration (Rubenstein, 2006).

Becker and Rapp (2010) stated falls result in an increased burden for nurses in long-term care settings, even if the falls do not result in a serious injury. They noted that residents may

require temporary additional support in activities of daily living and providing the additional support reduces nurses' working capacities in other areas. Whereas data on the costs of falls in long-term care settings are limited, Becker and Rapp stated that available studies estimate the mean costs per year of a single fall to be between $1, 000 and $2,000 dollars.

The Centers for Medicare and Medicaid Services (CMS) (2011) defines a fall as the unintentional change in position coming to rest on the ground, floor or onto the next lower surface. The CMS defines an intercepted fall as an occurrence when a resident would have fallen if he or she had not caught him or herself or had not been intercepted by another person. An intercepted fall is still considered a fall by the CMS. The CMS definitions of fall and intercepted fall will be utilized for this project to identify resident falls.

Significance of Study to Nursing and Health Care

Effective hand-off communication can play a critical role in assuring continuity and individualization of resident care. The Accreditation Committee of the Joint Commission's Board of Commissioners reviewed 22 cases of fatal falls in 24-hour care settings including general hospitals, a psychiatric hospital, long-term care settings, and non-hospital behavioral health care organizations to complete a root cause analysis (The Joint Commission, 2000). No information was provided regarding the selection process of the cases. However, six (27%) of the fatal falls occurred in long-term care settings. The Accreditation Committee noted that more than half of the 24-hour care settings identified communication issues among caregivers as the root cause of the fatal falls. The communication issues included failure to communicate information during nursing report, shift changes, or a transfer of an individual from a hospital to a long-term care setting; and caregivers not documenting changes in condition and/or families' communication about conditions and fall history.

According to Strople and Ottani (2006) there is compelling rationale for pioneering new and innovative methods of shift report as recommended by the IOM and The Joint Commission. Strople and Ottani noted that an automated report tool has the potential to assimilate assessment data and other pertinent patient-centered data in a clear and concise format. Development of innovative strategies to promote effective hand-off communication may contribute to safer care environments and improve resident outcomes related to falls.

Resident Information Care Essentials (RICE) is an information technology-based program for hand-off communication among STNA staff. RICE was co-developed by the author and a network security specialist for a long-term care corporation. Development of the program was the result of a quality improvement assessment conducted by the author at the long-term care facility that will be utilized for this project. The assessment revealed that hand-off communication was not taking place among the STNA staff of the long-term care facility because there was no shift to shift report. In addition, no specific mode of hand-off existed and the STNA staff did not consistently receive report from the licensed practical nurse (LPN) charge nurse.

RICE was developed based on: (a) current hand-off practices; (b)interviews with STNAs, LPNs, and registered nurses(RNs) from the facility and other facilities within the corporation; (c) the Minimum Data Set (MDS) 3.0 (CMS, 2011); (d) evidence from the literature; and (e) knowledge and skills of both co-developers. RICE includes the following resident information: (a) name, (b) age, (c) room number, (d) height, (e) weight, (f) allergies, (g) medical diagnoses, (h) resuscitation status, and (i) isolation status. In addition, RICE provides individualized information on each resident related to: (a) neurological functioning, (b) nutrition, (c)

elimination, (d) mobility, (e) bathing, (f) grooming, and (g) therapies. There is also a free text section for notes to alert caregivers of resident care changes or special care needs.

An RN or LPN is responsible for entering resident information. Data entered into RICE are similar to data collected for MDS 3.0 completion. For STNAs resident information appears in a read-only mode with an option to print the information on the computer screen.

The clinical problem addressed in this project focused on resident safety and communication among state tested nurse aides (STNAs) when resident care was transferred or handed-off. Specifically, this project examined whether RICE was associated with a decrease in the rate of falls among residents in a long-term care facility. In addition, this project assessed the characteristics associated with the residents who fell at the long-term care facility.

Project Questions

This project studied the effect of implementing an information technology-based program on communication among STNAs and resident safety related to falls. Specifically, this project intended to investigate the following:

1. Is implementation of RICE for hand-off communication associated with a decrease in the rate of falls among residents in a long-term care facility?
2. What characteristics are associated with the residents who fall at the long-term care facility?

Chapter Two: Review of Literature

Model for Review of the Literature

A model was developed by the author to guide the literature review related to this project (see Appendix A). Extraneous variables such as location, interruptions, participants' perceptions of hand-off, workload, and staffing directly impact the process of hand-off communication. In the model the concepts of mode, format, and time are presented as interconnected circles within a larger circle labeled as RICE because mode, format, and time are all dimensions of RICE and hand-off communication. The sender inputs resident information into RICE and obtains information from RICE. The receiver can access information the sender enters into RICE.

The concepts of mode, format, and time are present in every occurrence of hand-off communication. Mode represents the various manners that may be used to communicate information from one caregiver to another caregiver. Examples of mode include face to face, written, electronic, and telephone communication as well as audiotape recording. Format represents the various manners in which the information that is being handed-off is organized. Examples of format include standardized, such as situation, background, assessment, and recommendation (SBAR) (Institute for Healthcare Improvement, n.d.), or non-standardized, which would vary in format among different caregivers. Time represents the occurrences when hand-off communication is necessary. Examples of time include shift to shift, transfer of resident from one care setting to another care setting, and change in resident status.

Hand-off communication impacts the continuity of care provided to residents in the long-term care setting and depends upon the sender inputting accurate data into RICE. Resident outcomes, in turn, are impacted by the continuity of care provided to residents, including fall prevention.

Related Research

Hand-off communication.

A Cumulative Index to Nursing and Allied Health Literature (CINAHL) database search was conducted utilizing the terms: (a) nursing assistants and hand-off (Patient Safety), (b) nursing assistants and continuity of care, (c) nursing assistants and shift reports, and (d) nursing assistants and communication. The searches were limited to the years 2005 to present. No literature was found specifically addressing hand-off communication among STNA staff in the long-term care setting. In addition, the terms hand-off, outcomes (Health Care) and nursing home patients; and continuity of care, nursing home patients, and long-term care were searched; no literature was found specifically associated with resident outcomes as they relate to hand-off communication. Therefore, this literature review focuses on the broad topic of hand-off communication and is primarily related to nurses and inpatient settings.

Fenton (2006) noted that nursing hand-off always has been an important aspect of the communication process, because hand-off provides focus and direction to nurses at the start of their shift and assists in maintaining continuity of patient care. According to Davies and Priestly (2006) hand-off should be a critical communicative process that prepares the nurse for the care he or she will need to provide, rather than a description of what has already happened with the patient. Communication during hand-off needs to be accurate, clear, and specific and also needs to provide an opportunity for all caregivers involved to ask questions and voice concerns (Amato-Vealey, Barba, & Vealey, 2008; Strople & Ottani, 2006).

Transfer of patient accountability and responsibility from one caregiver to another caregiver highlights an important function of hand-off (Arora & Johnson, 2006; Strople & Ottani, 2006). Strople and Ottani state that nurses rely on the content and accuracy of hand-off

to make appropriate clinical decisions and to prioritize and plan patient care. They noted that it is essential that measures be taken to ensure hand-off information is congruent with the patient status.

Kerr (2002) asserts hand-off communication is crucial to allow caregiver changes to occur with minimum disruption to the functioning of the nursing ward or unit. In addition, hand-off allows nurses on the outgoing shift to share their knowledge of the patients with the nurses on the oncoming shift. Kerr conducted a cross-sectional, comparative, case study design utilizing two different wards to: (a) investigate practice activities of hand-off communication, (b) classify and characterize the functions of hand-off communication, and (c) identify effectiveness and problem criteria of hand-off communication. The results demonstrated that hand-off is a highly complex communication event, with a range of socially and technologically distributed practices and multiple functions. In addition, tension exists between presenting a comprehensive hand-off and spending too much time and/or providing information overload during hand-off.

Mode.

Sandlin (2007) noted that hand-off communication should be an interactive conversation between the person reporting off (sender) and the person taking report (receiver). A variety of modes exist for hand-off communication that includes a verbal or written component or a combination of both. They include: (a) face to face, (b) tape recorded, (c) bedside, (d) telephone, (e) written notes, and (f) electronic. Nelson and Massey (2010) noted that no one method in its entirety has been shown to be superior to the others.

According to Strople and Ottani (2006) several researchers have found deficiencies with a verbal shift report including: nurses being taken away from caring for patients and nurses not writing down information and/or retaining verbal information presented. Pothier, Monterio,

Mooktiar, and Shaw (2005) researched the differences in information retention for three hand-off modes in five simulated hand-off scenarios for the same 12 simulated patients. The three modes studied were: (a) a purely verbal mode with no note-taking, (b) a verbal mode with note-taking, and (c) verbal mode with a pre-prepared sheet that included all the patient's details. The results showed retention of 96% to 100% of information for the verbal mode with the pre-prepared sheet. Retention was lower at 38% to 58% for the verbal mode with note-taking and 0% to 26% for the verbal mode with no note-taking.

Sharit, McCane, Thevenin, and Barach (2008) conducted a qualitative study that used observation and semi-structured interviews to identify and examine medical risks to patients derived from hand-offs across shifts in a post-anesthesia care unit (PACU) and in a pediatric intensive care unit (PICU). According to Sharit et al., an association was established between the modes utilized by caregivers to perform hand-offs and problems in patient management that arose from the transfer of patient-related information during hand-off communication. They noted that a scenario in which a PICU nurse was not informed that a central spinal fluid drain used to draw off fluid was left open. This scenario could have been averted with a hands-on approach to conducting hand-off in the form of extensive head-to-toe assessment. Sharit et al. noted that hand-off also was affected by too many interruptions and not having a quieter workspace for hand-off prior to going to the patient bedside.

Matic, Davidson, and Salamonson (2010) conducted an integrative literature review to examine methods and modes of hand-off communication used in temporary health care settings and explore the feasibility of a computerized hand-off system for improving patient safety. They noted that "potential advantages of electronic tools include the standardization of data definitions, consistency with the information communicated, the minimization of ambiguities,

and the potential to increase process efficiencies" (p.187). In addition, an electronic computerized hand-off may improve the communication in hand-off by allowing nursing staff to have common expectations of what is to be communicated, the presentation of information requirements, and knowledge to be incorporated.

Stimpson, Joshi, Oakley, and Simo (2009) established a novel electronic hand-off using secure e-mail among otolaryngologists. The electronic hand-off system supported but did not replace traditional methods of communication between medical professionals. According to Stimpson et al., the electronic hand-off technique demonstrated improvements in hand-off. They noted that the electronic hand-off allowed for detailed information to be handed-off when face to face meetings were not possible for logistical reasons and electronic hand-off aided in preventing miscommunications.

Format.

Tailoring the hand-off protocol to the users, the environment in which hand-off is occurring, and the type of patients cared for needs to be taken into account when developing a standardized process for hand-off communication. Utilizing a process map can be helpful in assessing the integrity of the hand-off process because visualizing each step of the process allows vulnerabilities in the process to be detected and improved. In addition, mapping the process and building a standardized checklist of content can facilitate meeting the Joint Commission's NPSG regarding communication (Arora & Johnson, 2006).

A standardized approach to hand-off optimizes communication and minimizes omissions thus reducing patient risks (Amato-Vealey et al., 2008; Fenton, 2006). Sandlin (2007) stated that every facility should implement a standardized approach to hand-off communication including an opportunity for the receiver to ask questions. Arora and Johnson (2006) noted that buy-in

from leadership and ongoing education of staff has been instrumental to the implementation of standardized hand-off protocols.

Sullivan (2007) stated establishing format guidelines for hand-off is another means to assure that information communicated is complete. She discussed the establishment of clear format guidelines for how operating room circulating nurses and anesthesiologists would hand-off patients to the PACU caregivers. Sullivan also noted that streamlining the hand-off process helped to: (a) eliminate confusion, (b) provide clear and concise hand-off information, (c) decrease the time needed for hand-off, and (d) improve relationships among disciplines.

Fenton (2006) developed a hand-off guide based on Essence of Care benchmarks developed by the Department of Health in London. The Essence of Care benchmarks were: (a) resuscitation status, (b) diagnosis and presenting problem, (c) relevant past medical history, (d) investigations and pending results, (e) specific medical instructions, (f) continence, (g) pressure areas, (h) safety, (i) self-care, (j) hygiene and oral care, (k) privacy and dignity, (l) communication, and (m) nutrition and hydration. Fenton's hand-off guide included all the Essence of Care benchmarks except: (a) presenting problem, (b) relevant past medical history, and (c) specific medical instructions. The hand-off guide was implemented on a 26-bed ward for older adults in a community rehabilitation hospital. Prior to implementation of the hand-off guide it was found that safety factors such as poor vision or manual handling issues were not handed-off. Additional essential care items that were not handed-off prior to implementation of the hand-off guide included: continence, pressure areas, nutrition, hygiene needs, and communication. Fenton noted that after implementation of the guide a significant improvement was noted during hand-off in 10 of the 13 benchmarks, demonstrating a standardized approach optimizes communication and minimizes omissions, thereby reducing risks of harm.

Time.

Amato-Vealey et al. (2008) noted that hand-off occurs during times of transition of care often when nursing staff members are performing several other tasks simultaneously. They stated time should be set aside for hand-off communication, thereby allowing opportunities for questions and clarifications. Timely communication that is accurate, complete, unambiguous, and understood by the recipient reduces error and results in improved patient safety (Amato-Vealey et al., 2008; Sandlin, 2007).

Outcomes.

Spanke and Thomas (2010) investigated the impact of nursing assistant walking report at the change of shift on patient satisfaction, patient safety, falls, and pressure ulcers. The investigation was conducted on a 50-bed orthopedic and medical-surgical unit. They measured patient safety based upon the number of falls per 1000 patient days as well as pressure ulcer rates. Falls decreased from 5.09 preimplementation of walking rounds to 4.36 postimplementation of walking rounds, demonstrating a 14.3% reduction.

McFetridge, Gillespie, Goode, and Melby (2007) conducted a study to explore the process of patient hand-off by nurses when patients were transferred from emergency departments to intensive care units. A multi-method design that combined documentation review, semi-structured individual interviews, and focus group interviews was utilized for the study. The majority of nurses believed that an effective and accurate patient hand-off would positively impact the care delivered because they would know more information about the patient. McFetridge et al. noted that in support of outcomes the importance of hand-off was viewed to potentially reduce the risk of critical incidents. In addition, the nurses believed the hand-off process influenced continuity of care, safety, and quality patient care.

Ryan, O'Riordan, Tierney, Conlon, and Ridgway (2011) studied the efficacy and efficiency of a new electronic hand-off system for doctors compared to written paper hand-off by comparing the length of stay for patients admitted through the accident and emergency departments. The findings demonstrated a significant reduction in median length of stay following introduction of the electronic hand-off system compared with patients admitted during a separate time period when paper hand-off was utilized. Raptis, Fernandes, Chua, and Boulos (2009) compared paper-based and electronic based hand-off in regards to quality of information transferred from day to night staff. They found there was a significantly greater number of complete information fields with the electronic hand-off related to patient details, patient location, primary diagnosis, current problem, plan of action, and day team details. Raptis et al. noted that the study contributed to evidence which suggests that electronic hand-off reduces medical errors through better continuity of care and thus reduces patient morbidity and mortality.

The Center (2010b) stated breakdown in communication has been the principal contributing factor in sentinel events, and can lead to delays in treatment, inappropriate treatment, and increased length of stay in the hospital. In August 2009, The Center (2010b) implemented a hand-off communication project in 10 hospitals and health systems in the United States. Results indicated that more than 37% of hand-offs were defective and did not promote safe patient care by the receiver; and senders were dissatisfied with the quality of the hand-off communication 21% of the time. Utilization and full implementation of solutions, such as standardizing critical content, educating staff on what constitutes a successful hand-off, and monitoring compliance with standardized forms, reduced defective hand-offs by an average of 52%.

Summary.

Hand-off is a multifaceted, essential communication process that impacts continuity of patient care and needs to be accurate, clear, specific and timely. The process of hand-off communication involves a variety of modes, formats, timing, and outcomes. Electronic hand-off tools have the potential to improve standardization, consistency, clarity, and efficiency of patient information being transferred. This project will add to the evidence related hand-off communication in the long-term care setting among the STNA staff and utilization of an electronic tool for hand-off.

Chapter Three: Methods

Research Design

The investigation utilized a quasi-experimental interrupted time series research design (see Appendix C) to evaluate the use of RICE on a selected unit within a long-term care facility. Application for expedited review was submitted to The Ohio State University's Institutional Review Board (IRB) for approval prior to commencement of the project. It was approved at the expedited level due to the minimal risk to the study participants. The corporation that owns and operates the long-term care facility does not have an IRB; however, the proposal was approved by the President of the corporation and permission was granted to fully implement the project (see Appendix B).

Population and Sample

The population of interest for this study was residents of a long-term care facility. The project took place in a long-term care facility that is part of a corporation that owns and operates seven long-term care facilities. The facility chosen for the study had two nursing units. One resident unit was selected purposefully based upon a higher reported fall rate for that unit compared to the other unit during the time period of January 2011 through December 2011.

Methods

The long-term care facility, that was the setting for this study, provides skilled to intermediate nursing care and was a certified provider for Medicare, Medicaid, and most forms of private insurance. The facility had 99 beds spread across two units; there were 46 beds on the East unit and 53 beds on the West unit. The average census was 93 to 99 residents. Residents and staff were assigned to specific units throughout the long-term care facility. However, there were occasions when staff members were required to provide care to residents on a unit other

than their assigned unit. There was no specific algorithm for how residents were assigned within the facility and the case mix of residents was varied throughout the facility. Room assignment was based on several factors including: bed availability, resident preference, family preference, and compatibility of roommates. In addition, the East unit had nine private rooms that were utilized for short-term stay residents whose typical stay at the facility is 20 to 100 days. However, short-term stay residents may have been placed on either unit based upon room availability.

Retrospective fall reports for the two units within the long-term care facility were analyzed from January 2011 to December 2011, inclusive to determine the unit with the higher rate of falls. The East unit had the higher rate of falls was selected as the study unit, and utilization of RICE for hand-off communication was implemented on that unit. All the residents living within the selected unit were included in the investigation. It was assumed that selecting the unit with the higher rate of falls would increase the likelihood of detecting a change in the fall rates during the time period of the investigation.

RICE was installed on all computers in the long-term care facility in order to provide multiple locations for program access. Any nurse or STNA in the long-term care facility could have been assigned to the study unit during the 2-month investigation period. Therefore, prior to the start of data collection, a 1-week time period was allocated for orientation and full implementation of RICE on the study unit. The investigator provided orientation of RICE to all staff of the facility. The LPNs were oriented to RICE in groups of approximately 10-12. They had read only access to the system similar to the STNAs. The RN supervisors and MDS nurses who were responsible for data entry were oriented to the system on an individual basis. The STNA staff were oriented individually or in small groups of 2-4. Step by step directions were

displayed on the wall right beside the RICE access screens. In addition, a RICE handbook with directions for nurses and STNAs was placed at the East unit nurses' station and in the nursing supervisor's office. Contact information was provided for questions or if issues with RICE occurred during the investigation time period.

After selection of the study unit retrospective fall reports, resident charts, and RICE for all residents of that unit who sustained a fall (as defined by the CMS, 2011) was analyzed on a monthly basis for the 2-months preceding and following implementation of RICE. A change in fall rate was calculated between the two time intervals.

Falls as defined by the CMS (2011) are required to be reported on the resident's MDS. The MDS is a core set of screening, clinical, and functional status elements including common definitions and coding categories that forms the foundation of a comprehensive assessment for all residents of long-term care settings certified to participate in Medicare or Medicaid (CMS, 2011). The process for fall documentation included the nurse completing the required documentation related to the fall in the resident's chart and notifying the family and physician. In addition, an incident report form and a Falling Star Assessment (Appendix D) form were completed and placed in a designated location on the unit. These two forms were developed by the corporation and were utilized as part of the quality assurance process related to falls.

The incident reports and Falling Star Assessments were collected and reviewed daily Monday through Friday. Saturday and Sunday reports and assessments were reviewed on Monday. If a fall had occurred the Falls Committee at the facility met to review all the documentation for consistency and completeness. The committee consists of the facility administrator, director of nursing, MDS nurse, case manager, STNA coordinator, and social worker. The Falls Committee also reviewed the new interventions developed by the nursing

staff to address the fall. If the Falls Committee determined the interventions needed to be revised and/or additional interventions needed to be added to the resident's care plan, the MDS nurse updated the care plan. Additional interventions may include placing items within the resident's reach, clearing the environment of clutter, applying bright color tape to the call light, placing non-skid strips beside the resident's bed, and installing grab bars. The Quality Assurance nurse tracked all falls and other incidents that occurred within the facility and created a monthly report for the corporate office.

Instruments

Data regarding the number of falls within the facility were obtained from the Quality Assurance nurse. Specific information related to the falls that occurred after RICE implementation was collected from the resident's chart, incident report, Falling Star assessment, and RICE. Data were recorded on an electronic tracking form that contained no identifying resident information in order to maintain confidentiality of the resident and their health information (Appendix E). The electronic form was web based on the corporation's intranet. The form was password protected and only the author and network security specialist at the corporation had access to the data. Personal information that identified the resident was not linked with the data or reports once it was submitted. The data collected on the form assisted in determining if the resident information in RICE was associated with the fall and the characteristics associated with the falls.

Data Analysis

The rate of falls was calculated for the 2-month time period preceding and 2-month time period following implementation of RICE. Data were analyzed utilizing an independent samples test assuming Poisson distributed data in each time period. Poisson distribution models the

number of events occurring within a given time interval (NIST/SEMATECH, 2012). The p-value was set at 0.05. Statistical analysis was completed utilizing a generalized linear model routine in SPSS. The generalized linear model looks at distribution of data and Poisson is a distribution of data of which there is the ability to estimate means within the 2 groups separately. There was no evidence of a significant difference in the fall rate. The rate of falls actually increased 16.6% after implementation of RICE.

Chapter Four: Findings

Results

Even though there was an increase in the number of falls, there was a decrease in the number of residents who fell after implementation of RICE. For the 2-month time period prior to implementation, 16 residents fell for a total of 24 falls. There were only 10 residents who fell for the 2-month time period after implementation of RICE for a total of 28 falls.

Data were gathered to identify the characteristics associated with the falls that occurred after implementation of RICE. Of the falls taking place after implementation of RICE, 8 (29%) occurred between 6am and 2pm, 13 (46%) occurred between 2pm and 10pm, and 7 (25%) occurred between 10pm and 6am (Figure F1). There were 3 fall locations identified: 1 (3%) was in the hallway, 2 (7%) were in the residents' bathrooms and 25 (89%) were in the residents' rooms (Figure F2). The residents' activities at the time of the falls included: 11 (39%) were in bed, 9 (32%) were transferring sit to stand, 1 (4%) was transferring stand to sit and 7 (25%) were walking (Figure F3). Residents were found on the floor in 27 (96%) of the falls and only 1 (4%) resident lowered them self to the floor (Figure F4). No injuries were noted for 20 (71%) of the falls (Figure F5). Twenty-five (89%) of the falls were associated with a high fall risk rating on the institutions fall risk assessment and 3 (11%) were rated at risk for falls (Figure F6). One or more falls in the last 30 days was associated with 27 (96%) of the falls (Figure F7).

Additional information regarding specific characteristics was gathered for the 10 residents who were involved in the 28 falls after implementation of RICE. None of the residents who fell were independent; 1 required supervision by a staff member; 4 required assistance of 1 staff member; and 5 required assistance of 2 staff members (Figure F8). Confusion/impaired memory was noted in 8 of the residents who fell. Based on MDS data 9 of the residents had

altered gait, 7 had musculoskeletal weakness, 8 were incontinent of bowel, 7 were incontinent of urine, 5 had visual impairment and 1 had communication impairment. Nine of the 10 residents who experienced a fall were taking 1-6 prescribed psychotropic medications (Figure F9).

Discussion

Implementation of RICE for hand-off communication was not associated with a decrease in the rate of falls among residents in a long-term care facility. Based on the database that tracks access of RICE, a major factor that may have impacted the results was the STNA staff did not consistently utilize RICE for hand-off communication. In addition, the STNA staff may not have correctly synthesized the data in RICE and applied it to the care they provided to the residents. Study unit variables such as no control for the resident case-mix index, resident acuity, fall risk ratings on the study unit, staffing levels and composition of the STNA staff including years of experience and familiarity with the facility and residents potentially impacted the results.

During RICE orientation the STNA staff were receptive to the program and had only positive comments related to the ease of use and value of the system in their ability to provide appropriate resident care. However, access of the system by STNA staff was inconsistent and not utilized on a daily basis by all STNA staff assigned to the East unit. Access of RICE was not mandatory for this study because mandating access of RICE could not guarantee the STNAs read the resident's record related to their care needs.

Informal discussions were held with the STNAs throughout the implementation period to answer questions, address issues, and discuss the inconsistency of RICE utilization by STNA staff. The STNAs communicated that inconsistency of RICE access was not related to the program or the value of the information located in RICE. One STNA expressed concern that at the change of shift she was too busy to access the system due to care needs of residents and her

job responsibilities. Another STNA stated she had worked with the residents on the unit for an extended period of time and was familiar with the care needs of the residents on the unit so she did not have a need to access the system. In addition, the STNA stated she forgot about RICE at times because it was not part of her normal work routine.

Conclusions

Access of RICE on a daily basis by STNA staff would be beneficial because it provides information on new admissions, discharges and alerts on changes to resident care needs on the main STNA interface. Developing strategies with the STNA staff to assure consistent utilization of the program could potentially impact the fall rate. A strategy may include additional education of the STNA staff on the usefulness of the information in RICE for their daily resident care responsibilities. Assessment of STNAs' knowledge of RICE may assist to identify STNAs that need additional orientation to the program. Another strategy that may assist to increase the consistency of use would be providing a designated time at the start of the STNA's shift that they are required and able to access the system without the additional responsibility of addressing resident care needs. This may require a slight change to the unit's routine in relation to resident meal times and activities.

Controlling study unit variables was difficult due to the various reasons and may have impacted the results of the study. As mentioned previously, there was no specific algorithm for how residents were assigned to a unit within the facility. Variations in residents' health and functional status throughout the investigation that may have contributed to falls could not be controlled. Changes in the staffing levels and staffing mix on the unit were affected by factors such as call-offs, floating to cover call-offs, presence of STNA trainees and new hires.

Resident information in RICE was associated with the falls and identifies risk factors related to falls. Rubenstein (2006) discussed individual risk factors for falls based on a summary of 16 controlled studies. The risk factors included: weakness, balance deficit, gait deficit, visual deficit, mobility limitation, cognitive impairment, impaired functional status, and postural hypotension. RICE provides resident information related to these risk factors including: diagnosis; fall risk; assistance and adaptive equipment required for activities of daily living; consciousness and orientation; and vision and hearing status. Information in RICE may not have been synthesized correctly by the STNA staff to assist in the identification of factors other than the fall risk rating that impact a resident's risk for falls in order to change the manner in which they provide care. The characteristics of the residents who fell after implementation are similar to the risk factors identified by Rubenstein (2006). The majority of residents had altered gait, confusion and/or impaired memory, and musculoskeletal weakness. Given that 9 out of 10 residents who fell were prescribed one or more psychotropic medications, adding a section on RICE to identify residents on psychotropic medications may assist STNA staff to recognize those residents and revise care to decrease the rate of falls. Providing education to STNA staff on identification of specific fall risk factors beside the fall risk rating that are part of RICE may assist the STNA to detect residents who require frequent checks and closer supervision.

Chapter Five:

Summary

Hand-off communication plays a critical role in the healthcare industry as institutions continue to strive for safe, quality, effective patient care with positive patient outcomes. In this study implementation of RICE for hand-off communication was not associated with a decrease in the rate of falls among residents in a long-term care facility. However, this study represents a beginning in researching the impact of an electronic mode for hand-off communication among STNA staff in a long-term care setting.

Limitations

The brief investigative time period may not have been long enough to have the power to detect a change in the rate of falls. There was only a brief time period for the staff to gain experience with RICE. The study was limited to one unit in a long-term care facility. Implementing RICE for a longer time period and with a larger resident population may potentially impact the results of the study.

Implications

Resident Information Care Essentials (RICE) should be further investigated to determine the impact it may have on hand-off communication among STNA staff in a long-term care setting. Additional research could be conducted to investigate

- the impact of RICE on falls for the same population over another 2 month time period when access of RICE by STNA staff is mandatory;
- STNA satisfaction with ease of access and usability of RICE;
- comparison of falls among residents who were cared for by STNAs who accessed RICE and STNAs who did not access RICE;

- comparison of RICE hand-off with other hand-off modalities utilized in the long-term care setting such as face to face, tape recorded, bedside, written, or hybrid including RICE and another modality for hand-off;
- knowledge of resident care needs among RICE users and non-users; and
- the impact of age and technology literacy on the utilization of RICE by the STNA staff.

The affect of RICE other clinical outcomes such as weight loss, development of pressure ulcers, episodes of urinary or bowel incontinence and resident functional ability merits additional study. Due to a national focus on improving the effectiveness of hand-off communication, additional research needs to be conducted to focus on strategies to improve hand-off communication in a wide variety of healthcare settings at all levels of patient care.

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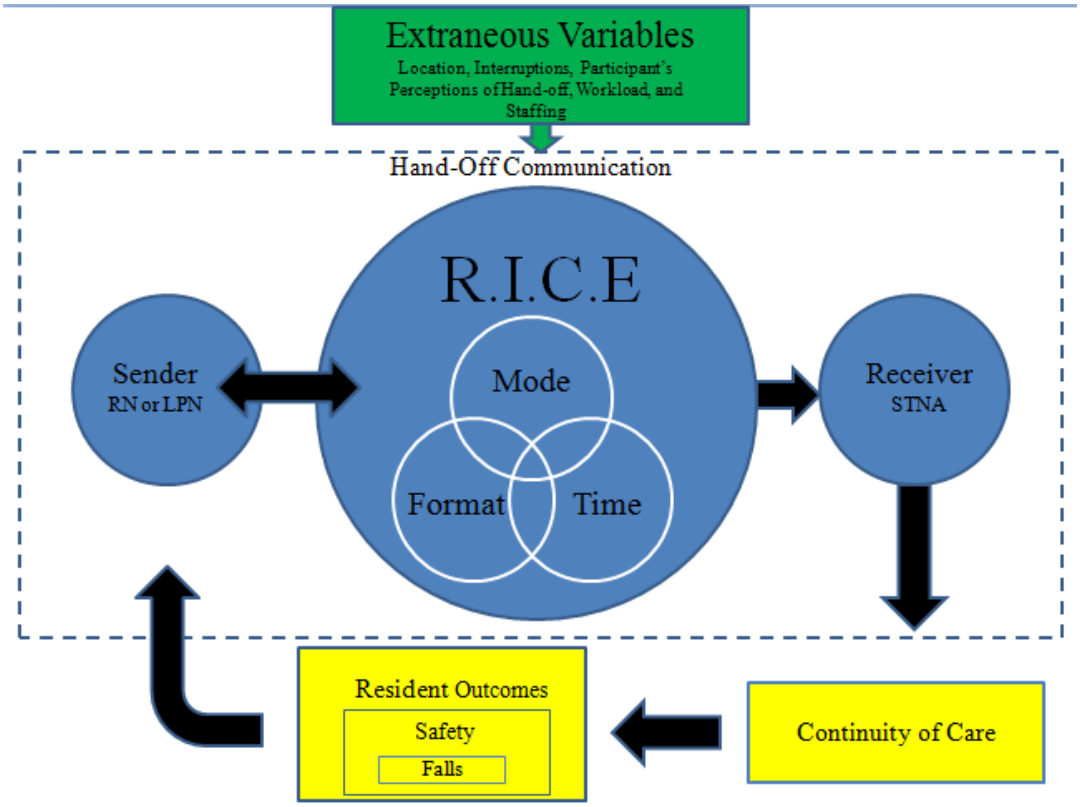
Appendix A

Hand-off Communication Model to Guide Literature Review



Appendix B

ZANDEX
HEALTH CARE CORPORATION

Office of Responsible Research Practices
The Ohio State University
300 Research Administration Building
1960 Kenny Road
Columbus, Ohio 43210-1063

April 25, 2012

Dear Office of Responsible Research Practices:

This letter will serve as authorization for Dr. Linda S. Daley (Principal Investigator) and Sheryl K. House (Co-Investigator) to conduct the project entitled, "Hand-Off Communication Among State Tested Nurse Aide Staff in Long-Term Care" at Cedar Hill Care Center in Zanesville, Ohio. Based on HIPPA Privacy Rule, Dr. Linda S. Daley and Sheryl K. House have authorization to access retrospective data from residents' charts, incident reports, Falling Star Assessments, and Resident Information Care Essentials (R.I.C.E.). Dr. Linda S. Daley and Sheryl K. House have signed a Zandex/ADL Confidentiality and Conditions of Use Agreement.

Zandex Health Care acknowledges that it has reviewed the protocol presented by the researcher, as well as the associated risks to the facility and corporation. Zandex Health Care acknowledges neither Dr. Linda S. Daley nor Sheryl K. House have a financial interest that would reasonably appear to be affected by the project, or a financial interest in any entity whose financial interest would reasonable appear to be affected by the project. Zandex Health Care accepts the protocol and the associated risks to the facility and corporation, and authorizes the project to proceed. The project may be implemented at Cedar Hill Care Center upon approval from The Ohio State University's Institutional Review Board.

If we have any concerns or require additional information, we will contact the researchers and/or The Ohio State University's Office of Responsible Research Practices.

Sincerely,

Douglas L Ramsay

Dr. Douglas Ramsay
President, Zandex Health Care

Appendix C

Research Design

O1 O2 X O1 O2

O=Monthly observations of fall occurrences on a selected long-term care facility

X=Implementation of the electronic computer based program for hand-off communication

Appendix D

Incident Report and Falling Star Assessment

CONFIDENTIAL

INCIDENT / ACCIDENT REPORT

"An incident is any happening which is now consistent with the routine operation of the facility or the routine care of a particular resident it may be an accident or a situation which might result in an accident."

PERSON INVOLVED (Last Name) (First Name) (Middle Initial)

Male ☐ Female ☐ Age _____ Resident Number _____

Date of Incident ___/___/___ Time of Incident ☐AM ☐PM Exact Location of Incident ☐ Resident's Room ☐ Hallway ☐ Bathroom ☐ Other (Specify)

Resident ☐ Resident's Condition Before Incident
Normal ☐ Senile ☐ Disoriented ☐ Sedated ☐ Other Room No.

Were Bed Rails Present Yes ☐ No ☐ Up ☐ Down ☐ Ordered ☐ Was Height of Bed Adjustable Yes ☐ No ☐ Up ☐ Down ☐

Employee ☐ Department Job Title

Visitor ☐ Home Address Home Phone

Occupation Reason for Presence at this Facility

Other ☐

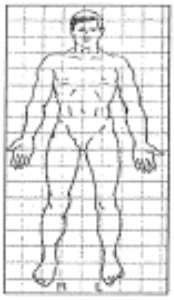
Property Involved ☐ Equipment Involved ☐ Describe Was this person authorized to be at a location of incident ☐ Yes ☐No

Describe Exactly What Happened. Action Taken. If an injury. State Part of Body Injured. If Property of Equipment Damaged. Describe Damage

Was Physician Notified ? Yes ☐ No ☐ Was Family Notified? Yes ☐ No ☐

Was Person Involved Seen By A Physician? Yes No Date ___/___/___ Time AM PM Where Physician's Name

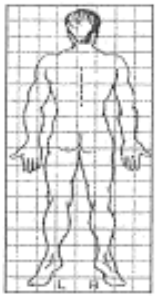
Was Person Involved Taken To A Hospital? Yes ☐ No ☐ Date ___/___/___ Time AM PM Where By Whom



Indicate On Diagram Location of Injury

TYPE OF INJURY
1. Laceration ☐
2. Hematoma ☐
3. Abrasion ☐
4. Burn ☐
5. Non Apparent ☐
6. Other ☐
Specify _____

ACCIDENT
1. Fatal ☐
2. Non Fatal ☐



Name, Address & Phone No. of All Witness(es)

Follow-Up

Date of Report ___/___/___ Signature & Title of Person Preparing Report Place original in permanent file and copy to administrator

Falling Star Assessment

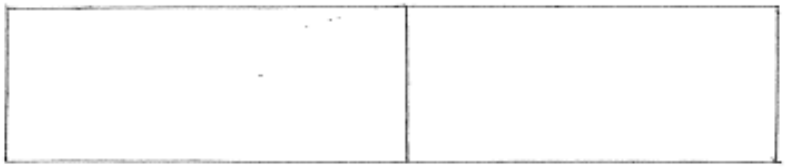
FALLING STAR ASSESSMENT

RESIDENT'S NAME_____ROOM#_____

DATE OF FALL_____TIME OF FALL_____

RESIDENT'S STATEMENT RE: FALL (ASK "R" AT TIME OF FALL):_____

WHERE WAS "R" FOUND? (NOTE EXACT LOCATION AND HOW "R" FOUND, DRAW SAME IN BOXES PROVIDED,



POSSIBLE REASON FOR FALL

SHOES ON_____NON-SKID?_____

ORDER FOR SIDERAILS?_____UP, IF APPROPRIATE? ____ UP X1/X2_____

ORDER FOR RESTRAINTS? _____ON,IF APPROPRIATE_____TYPE_____

CALL LIGHT W/IN REACH?_____

H2O at BEDSIDE_____

GLASSES ACCESSIBLE?_____GLASSES ON?_____

"R" HAVE A TOILETING PLAN?____BEING FOLLOWED ACCURATELY?__

WAS FLOOR WET/DRY?_____LINENS/CLOTHING IN PATHWAY?_____

USING APPROPRIATE ASSISTIVE DEVICE?_____(W/C,WALKER, CANE)

WERE WHEELS LOCKED ON W/C?_____

DID FALL OCCUR DURING TRANSFER?_____WAS GAIT BELT WORN?__

POSSIBLE REASONS FOR FALL-INTRINSIC FACTORS (ANSWER YES/NO)

Cognitive Loss?_____Understands Re-direction?_____

Musculoskeletal Weakness_____

Hemiplegia/Quadriplegia?_____(Explain)_____

Recent Fracture?____Where_____D/T Fall?_____

Contractures/limitations?_____Where_____

Unsteady Gait?_____Poor Eye Sight?_____Trouble Judging one side_____

Denial of Limitations_____

Overestimations of abilities_____

Incontinent_____Is Bed/Chair/"R" wet at time of fall_____

Refuses to ask for assist_____Refuses to use appropriate device_____

Anxiety_____Other:_____

EXTRINSIC FACTORS (ANSWER YES/NO)

Currently taking Psychoactive Meds?_____

Mellaril___Haldol___Compazine___Risperdal___Valium___Dalmane___Klonopin___

Librium___Xanax___Ativan___Serax___Restoril___Ambien___Hydroxyzine___

Other_____

In last 90 days, has "R" received any Psychoactive Meds?___

IF yes, Explain_____

In last 90 days, has any Psychoactive Meds been D/C?___

IF yes, Explain_____

Is this the first fall in the last 30 days?____

Is Incident Report complete?____

NURSE

SIGNATURE_____Date_____

F/U Complete?___Fall Assessment Complete_____Care Plan Complete____

Pain addressed_____Pain med given?_____

Intervention in

place_____

Appendix E

Data Collection Form

Research ID#:

Fall Date: Fall Time: Date of Last Fall:

Fall Location: Number of Falls in the Last 30 Days:

☐ Found on floor ☐ Staff lowered patient to floor ☐ Patient lowered self to floor

☐ Intercepted fall

Resident: ☐ Walking ☐ Being wheeled in chair ☐ Transferring sit to stand

☐ Transferring stand to sit ☐ In bed

Medical Diagnoses:

Age: ☐ 59 and below ☐ 60-69 ☐ 70-79 ☐ 80-89 ☐ 90-99 ☐ 100 and above

Recent Fall Risk Scale Rating:

Actual staff/resident ratio at time of fall:

STNA assigned to resident and/or involved in fall trained on RICE Program: ☐ Yes ☐ No

STNA assigned to resident and/or involved in fall access RICE Program: ☐ Yes ☐ No

Description of the event including what the resident was doing or trying to do that may have contributed to the fall.

Contributing Factors (Check all that apply)

☐ **Patient care environment unsafe or contributory to fall**

☐ Floor wet ☐ Uneven floor surface ☐ Loose carpet or rug ☐ Dim lighting

☐ Call light not within reach ☐ Needed item out of reach ☐ Cluttered area

☐ Bed side rails (circle appropriate choice(s): all up or down 1 up (left right) top half up

(left right) bottom half up (left right) ☐ Other, please specify:

☐ **Patient care equipment unsafe or contributory to fall**

☐ No foot wear ☐ Slippery footwear ☐ Improper fitting footwear ☐ Slippery footwear

☐ Untied footwear ☐ Shower chair/commode chair ☐ Cane ☐ Walker ☐ Wheelchair

☐ Unavailable grab bars ☐ Bed ☐ Hoyer Lift ☐ Gait Belt

☐ Other, please specify:

Equipment was used incorrectly by: ☐ Resident ☐ Staff ☐ Both
Describe:

Mobility:
☐ Up ad lib ☐ Ambulate with assistive device (walker/cane) ☐ Wheelchair ☐ Bed rest

☐ Requires ADL Assistance (circle appropriate choice(s): supervision, assist of 1, assist of 2)

☐ Restraints ☐ Other, please specify

Assistive Devices:
☐ Assistive Devices involved in fall ☐ Needed transfer/mobility equipment NOT within

reach? ☐ Equipment not correctly or safely used by patient? ☐ Other, please specify:

Cognitive, Sensory & Functional factors:
☐ Incontinent (circle appropriate choice(s): bowel or bladder) ☐ Confused/memory impaired

☐ Altered gait/balance ☐ Musculoskeletal weakness, Describe:

☐ Visual Impairment ☐ Communication impairment

Other factors:
☐ Psychotropic medication, Describe: ☐ Overestimation of abilities

☐ Refuses to ask for assistance ☐ Other, please specify:
Preventive Measures prior to incident (check all that apply): ☐ Interdisciplinary Fall Prevention Care Plan implemented & communicated to entire team ☐ Increase level of observation ☐ Fall Alert Identifier (e.g., armband, sign, symbol) ☐ Patient close to nurses' station ☐ Motion alarm ☐ Call light/bell in reach

Injury from Fall (Check all that apply)

Injury: ☐ No Injury ☐ Laceration ☐ Hematoma ☐ Abrasion ☐ Burn ☐ Fracture ☐ Death ☐ Other:
Resident Transported to Hospital: ☐ Yes ☐ No

Appendix F

Figure 1

Falls by Shift

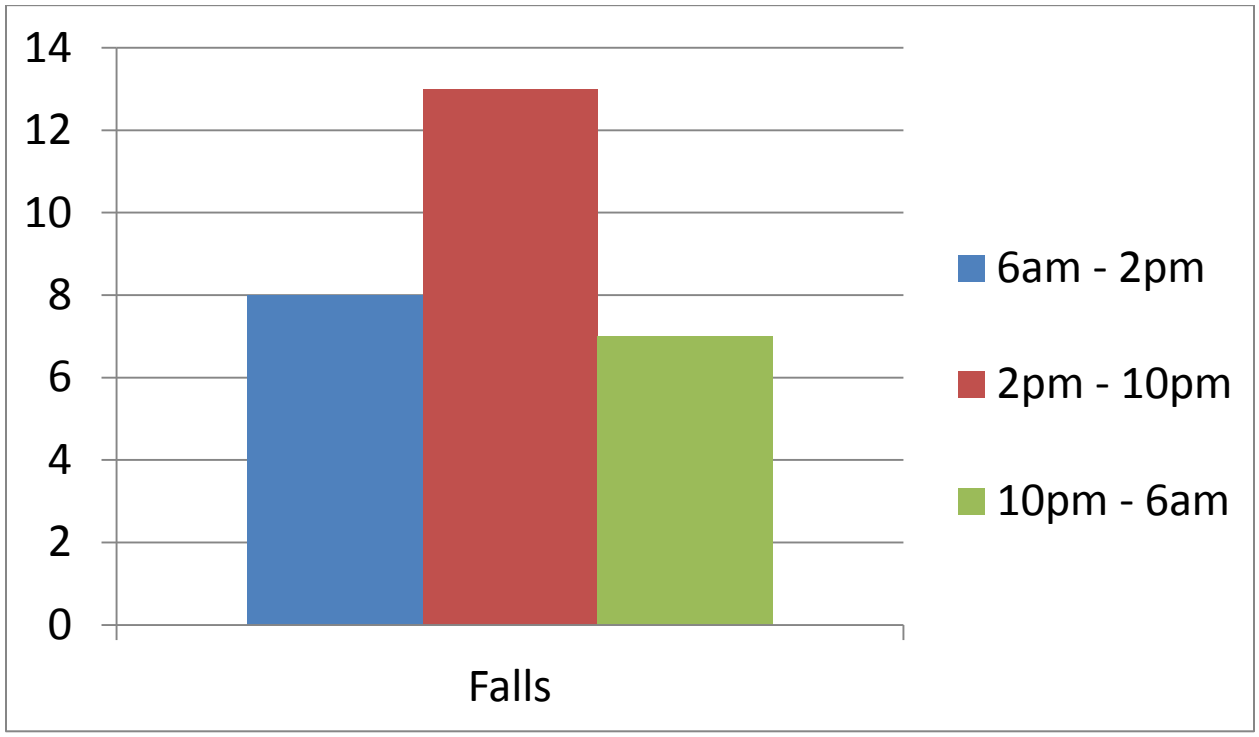


Figure 2

Fall Locations

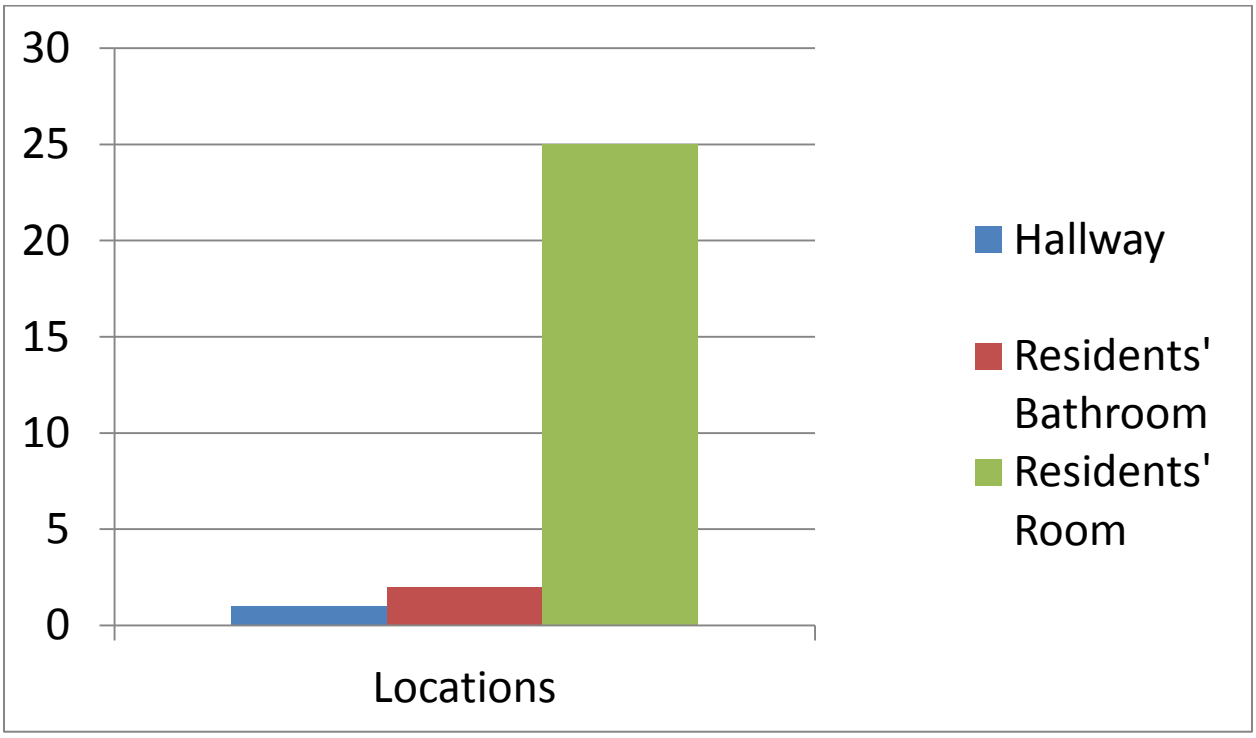


Figure 3

Activity at Time of Fall

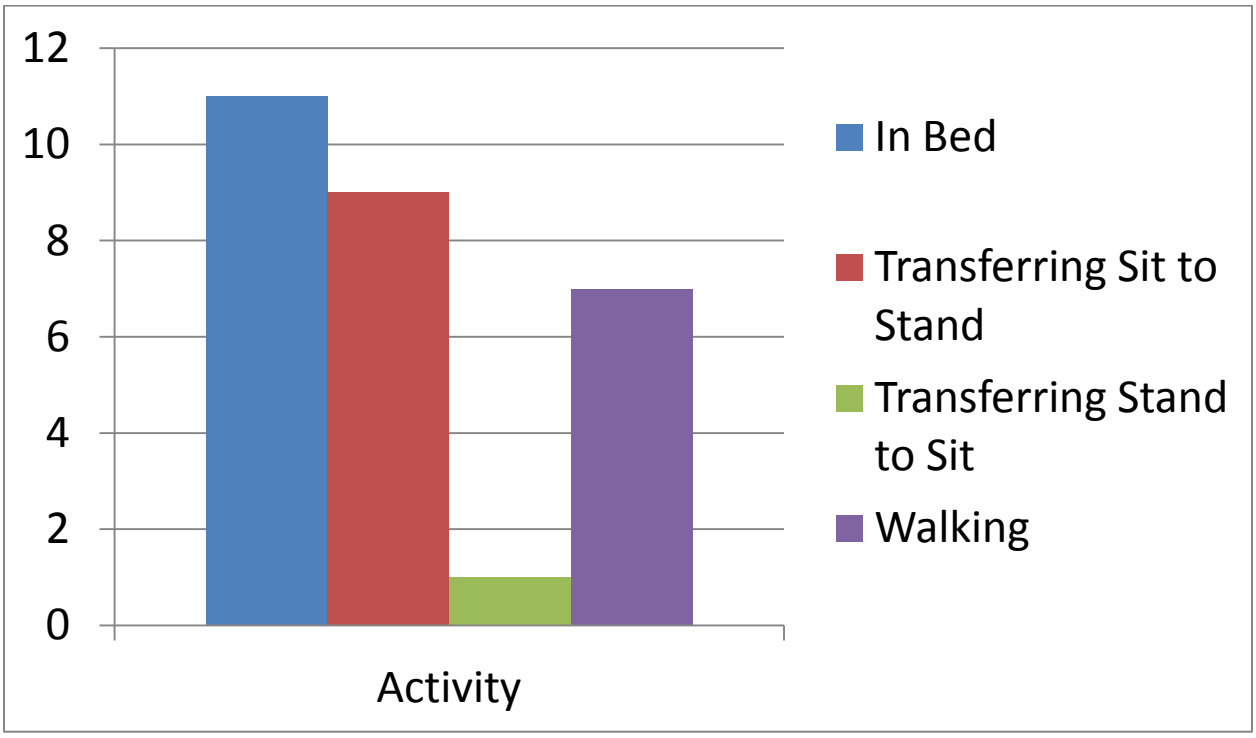


Figure 4

Fall Action

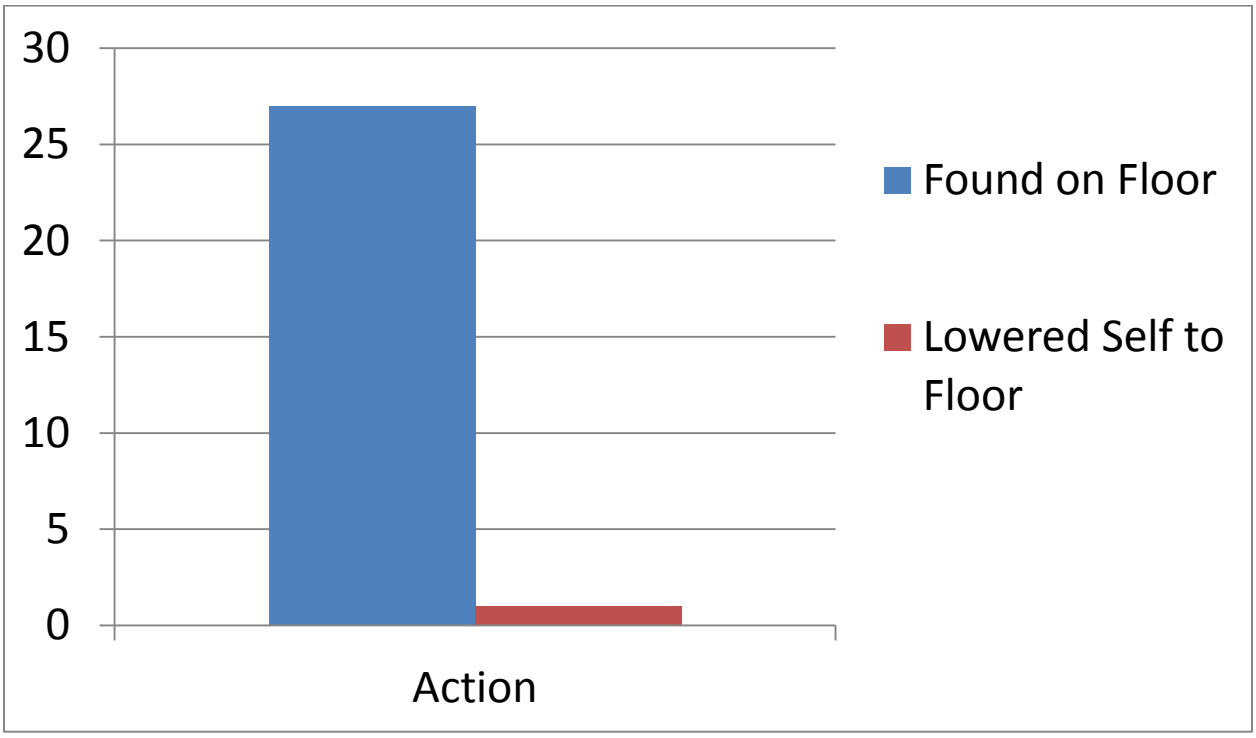


Figure 5

Injuries

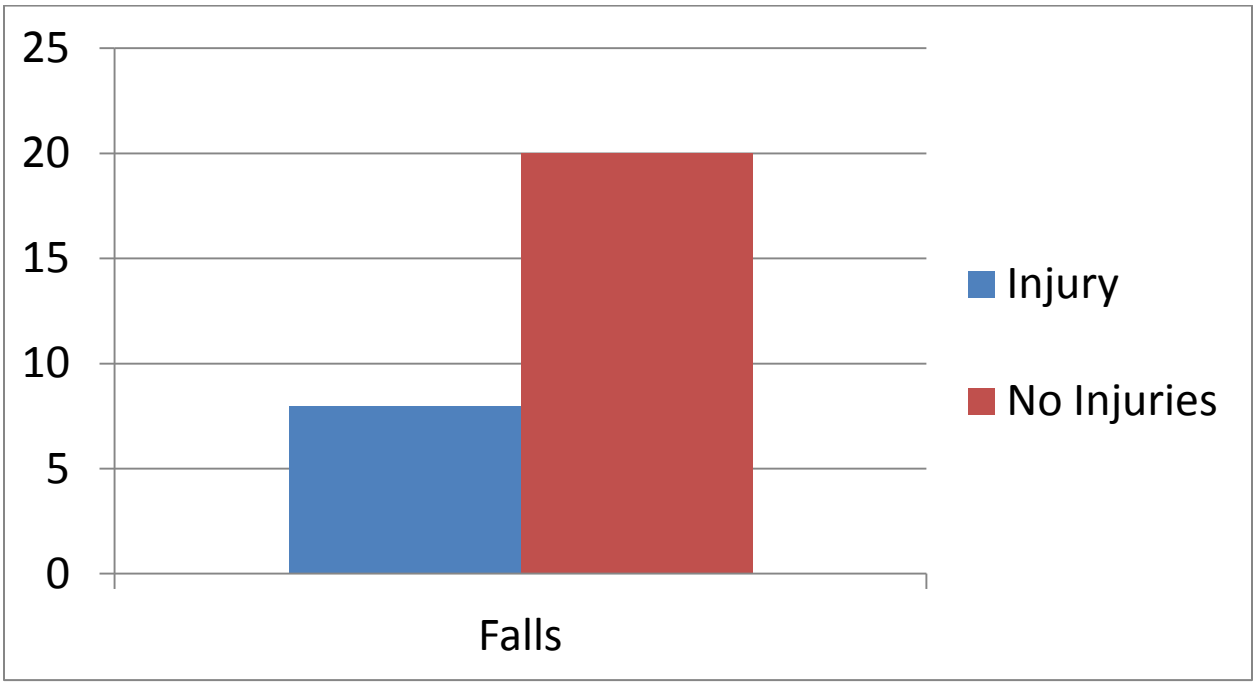


Figure 6

Fall Risk Rating

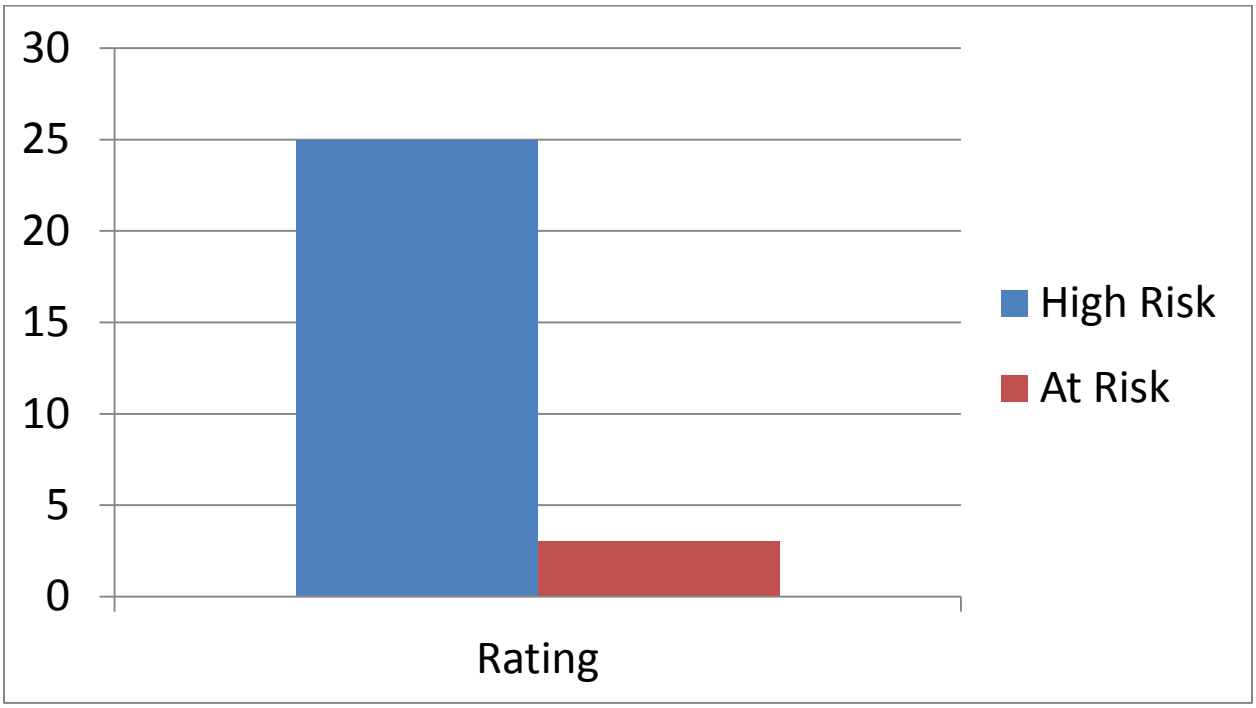


Figure 7

Number of Falls in Last 30 Days

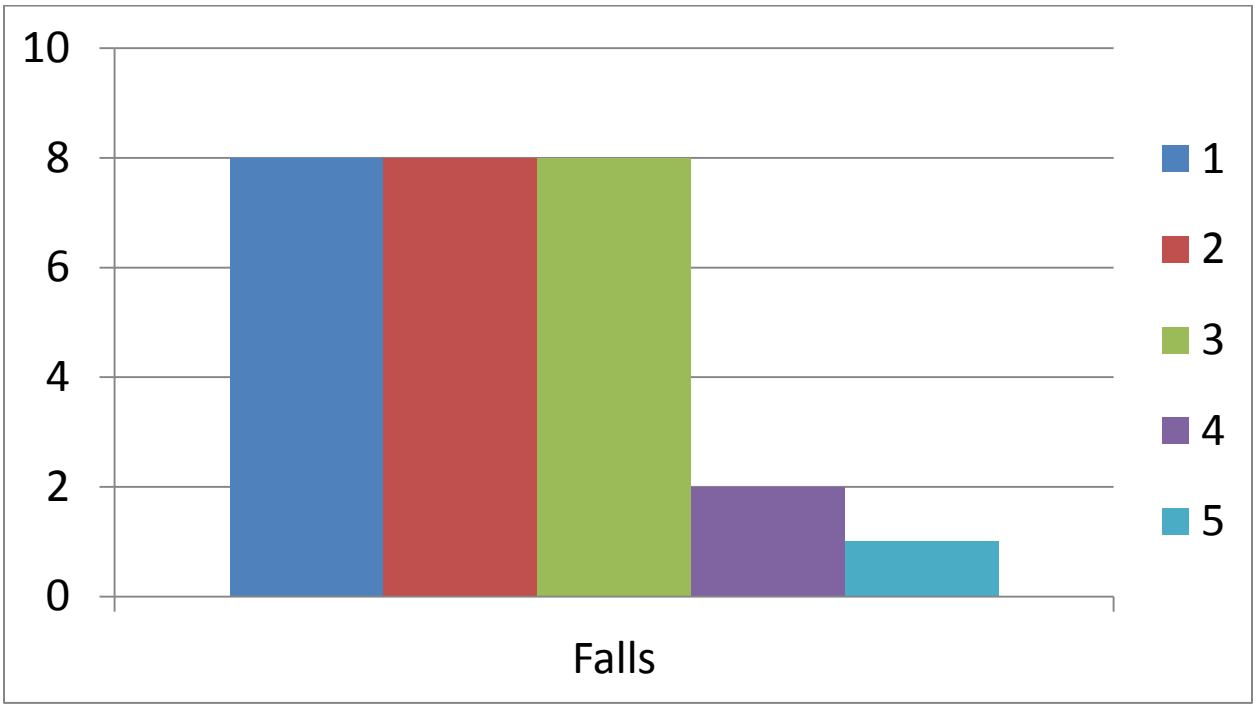


Figure 8

Required Staff Assistance

Figure 9

Resident Cognitive, Sensory & Functional Status